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OBSERVATIONS
ON THE
DIFFERENT KINDS
OF
IMPEDIMENTS OF SPEECH,
PARTICULARLY
SPASMODIC STAMMERING:

WITH INSTRUCTIONS HOW TO REMOVE THEM.

BY A. M. HARTLEY,
Teacher of Elocution.

LONDON:
PUBLISHED BY SIMPKIN & MARSHALL;
W. CURRY, JUN., & CO., DUBLIN;
WILLIAM TAIT, EDINBURGH; AND ATKINSON & CO., GLASGOW.

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OBSERVATIONS

ON THE

IMPEDIMENTS OF SPEECH.

VOICE.

By voice is to be understood the sound produced by the air in its passage through the larynx, either when issuing into the lungs, or discharging from them. When the sound so produced is articulated by the tongue, palate, teeth, and lips, it is called speech, hence the larynx may be denominated the organ of voice; and the tongue, lips, teeth, and palate, the organs of speech. According to the perfection of the larynx, slightly modified by the pharynx, will be the *quality* of the voice; its tone and *quantity* depend on causes hereafter to be explained. Clearness or distinctness of speech, or what is more properly called purity of articulation, depends on the soundness and harmonious concordance of the articulating organs.

The larynx is a thin cartilaginous box, placed in the upper and fore part of the neck, below the root of the tongue, at the upper end of the trachea, before the pharynx; and forms that protuberance which, from an absurd opinion that a part of the forbidden fruit stuck in Adam's throat, is called POMUM ADAMI. It is composed of five movable cartilages. The first is the thyroid,[*] so called from its resemblance to a *shield;* it makes that protuberance in the fore part of the neck, particularly called *Pomum Adami,* and is rather thin and about an inch broad, but not quite so long; it is concave within and convex without, having four angles, from each of which a small process projects. The two upper, which are longer, are joined to the horns of the os hyoides, and the two lower to the second cartilage called the *cricoid,*[†] because it resembles a *ring.* This is very large and thick behind, resembling the stone of a ring, and grows narrower as it approaches the anterior part. It is situated below the other cartilages, and supports them like a basis; it also joins them to the trachea.

The third and fourth are similar, and are called the ARYTENOIDES.[‡] They extend from the middle of the concave side of the thyroid, to the upper and back part of the cricoid, and make that chink, or rimula, which is called the glottis, or mouth of the larynx; betwixt these and the side of the thyroid are two small cavities on each side, formed by the muscles and membranes that join them together;

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[*] From Θυϱεος and ειδος, resembling a shield.

[†] From Κϱικοειδης, like a ring.

[‡] From Αϱυταινα and ειδος, like a drinking cup.

in which if a little bread or any liquid fall,—as sometimes happens, if one laughs or speaks while eating or drinking,— it causes violent tickling, pain, and coughing.

The fifth and last is called the Epiglottis: it is of a softer substance than any of the others, and resembles a little tongue tied by its basis to the superior and middle part of the concave side of the thyroid cartilage. Its principal use seems to be to cover and protect the glottis during the act of deglutition; for the aliments by their weight press it close upon the glottis, and pass over it into the œsophagus, without entering the larynx. As soon as the aliment has passed, the epiglottis, by the retort natural to all cartilages, immediately rebounds, and leaves a free passage for respiration. Hence, while we speak or laugh, the glottis must necessarily be open, to give free entrance and emission to the air through the trachea. The admirable beauty and perfection of this piece of mechanism, cannot easily be better described than in the words of Paley: "Another exquisite structure," observes he, "is seen in the larynx. We all know that there go down the throat two pipes,—one leading to the stomach, another to the lungs; the one being the passage for the food, the other for the breath and voice: we know also that these passages open into the bottom of the mouth, the gullet necessarily for the conveyance of food, and the wind-pipe for speech and the modulation of sound, not less necessarily; therefore, the difficulty was, the passage being so contiguous, to prevent the food, especially the liquids, which we swallow into the stomach, from entering the wind-pipe, *i. e.* the road to the lungs; the consequence of which error, when it does happen, is perceived by the convulsive throes that are instantly produced. This business, which is very nice, is managed in this manner: the gullet (the passage for food) opens into the mouth like the cone or upper part of a funnel, the capacity of which forms indeed the bottom of the mouth. Into the side of this funnel, at the part which lies the lowest, enters the wind-pipe, by a chink or slit, with a lid or flap like a little tongue, accurately fitted to the orifice; the solids or liquids which we swallow pass over this lid or flap, as they descend by the funnel into the gullet; both the weight of the food, and the action of the muscles concerned in swallowing, contribute to keep the lid close down upon the aperture whilst any thing is passing; whereas, by means of its natural cartilaginous spring, it raises itself a little as soon as the food is passed, thereby allowing a free inlet and outlet for the respiration of air by the lungs. Such is its structure; and we may here remark the almost complete success of the expedient; viz. how seldom it fails of its purpose, compared with the number of instances in which it fulfills it. Reflect how frequently we swallow—how constantly we breathe! In a city feast, for example, what deglutition! what anhelation! yet does this little cartilage, the epiglottis, so effectually interpose its office, so securely guard the entrance of the wind-pipe, that, whilst morsel after morsel, draught after draught, are coursing one another over it, an accident of a crumb or a drop slipping into this passage, which nevertheless must be opened for the breath every second of time, excites in the whole company not only alarm by its danger, but surprise by its novelty. Not two guests are choked in a century."

So exquisitely fitted to the rimula or *glottis,* is the flap, and so sensitive are it and its collateral membranes to the east touch or particle, that a *grape-stone,* accidentally lodging between the flap and the side of the orifice, cost Anacreon his life.

Until Majendie proved by experiments the contrary, the *sole* use of the epiglottis was considered to be to protect the rimula of the glottis during deglutition; but he has shown, that the epiglottis "may be entirely taken away without deglutition suffering the least injury by it." He had himself seen two cases, and if my memory serves me rightly, Richerand states that he had seen one or two cases. I myself saw one case in the Museum of Dr Hunter, professor of Anatomy in the Andersonian University, Glasgow,* where the epiglottis had been entirely consumed by disease; and yet the person to whom it belonged felt little inconvenience in performing any of the functions belonging to the glottis, except *speaking.*

"What then," observes Majendie, "is the reason that no part of the food is introduced into the larynx the instant we swallow? The reason is this: in the instant the larynx is raised and engaged behind the os hyoides, the glottis shuts with the greatest closeness. This motion is produced by the *same muscles* that press the glottis in the *production of voice;* so that if any animal has the recurrent nerves of the larynx divided, whilst the epiglottis is *left untouched*, its deglutition is rendered very difficult, because the principal cause is removed which opposes the introduction of food into the glottis."

The size of the larynx varies according to age and sex; its muscles and nerves are exceedingly nice and complicated, adapted to produce all the modifications of tone, and variety of notes, besides modifying the air in its passage from and to the lungs; indeed, without it, or something like it, we could have received little benefit from breathing. For if the mouth of the *aspera arteria,* had been large and wide, the air would not have resisted that force by which it is thurst out in expiration, so as to make any compression on the lungs, by which the globules of the blood could have been dissolved, or the particles of both fluids mixed together, which we find so necessary to life, that we die without it.

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* Too much praise cannot be bestowed on this gentleman, for his perseverance and discrimination in procuring the rarest and most useful specimens of every thing connected with his profession. In this respect, as well as with respect to the other departments of his profession, he eminently sustains the dignity and fame of a name already immortalized.

Thus we see that the larynx, if not essential to life, is at least very useful in the preservation of it. We see, moreover, how much it conduces to render life agreeable, by forming the different modifications of the voice, enabling man to imitate every species and shade of sound that the ear can distinguish.

THE CRY by which infants express their wants and feelings, is called *vagitus.* Towards the end of the first year, this cry is materially altered in tone and quality, and then nurses commonly begin to teach infants to pronounce words. The pronunciation of infants differs much from that of adults, because their organs are yet very incomplete; but as their lips, tongue, and nasal cavities acquire, by degrees, more proportion and strength, and their teeth grow—their pronunciation approaches that of the adult. Thus it continues till the age of puberty; when the larynx and the lips of the glottis undergo remarkable modifications, particularly in boys. The voice, which was before acute and clear, becomes grave and hoarse; the speaker loses all command of tone. When he wishes to utter a grave, he often utters an acute; when he wishes to utter an acute, he utters a grave tone: in some cases the voice is entirely lost. In this state, the voice of a young man is said *to moult.* It continues thus about twelve or eighteen months, and then becomes more clear, and finer, and manageable, and continues so till old age. Some who have a very fine voice before it undergoes this change, have afterwards a very ordinary, or coarse one;—in others, it is incomparably improved. It is during this process also, that the projection in the anterior part of the neck already described, and called *pomum Adami*, becomes large and prominent. In females, the larynx does not undergo this change, consequently their voices remain always acute.

In old age the voice greatly alters. The cartilages of the larynx become more rigid, and sometimes ossified; the pronunciation more fatiguing; the teeth become shorter, or are entirely lost; the muscular contraction of the glottis and epiglottis becomes impaired; the motions of the larynx and lips slower, and the whole of Shakspeare's sixth and seventh ages complete:

> " The big manly voice,
> *Turning again towards childish treble,* pipes
> And whistles in its sound. *Last scene of all,*
> That ends this strange eventful history,
> Is second childishness and mere oblivion :
> *Sans teeth, sans eyes, sans taste, sans every thing !*"

SINGING differs from speaking in this, that in the former there is a *gradation* in the *notes,* regulated by laws, which require that *between each* note, there should be an appreciable *silent* space : while in the latter, these *silent spaces* are generally filled up with sound. In singing, the voice is governed by immutable laws ; the chief beauty of speaking consists in its mutability,—or what is generally called its *variety.* In singing, an ordinary voice has about nine of these *graduated tones,* between the gravest and most acute sounds. Few voices possess more than two perfect octaves. Acute voices belong to women, children, and eunuchs ; grave voices, to full grown men. Any person, however, can utter an acute sound by what is called the *falsetto :* the number of tones between the grave and the acute being added, makes about three octaves.

In singing, moreover, each *note* is susceptible of all degrees of *strength :* for the strength of the voice is in proportion to the quantity of air propelled through the larynx during the sounding of the note. If the strength of the note is to be increased, the diaphragm, and more especially the muscular fibres of the *trachea arteria,* contract, and force out the current of air, while the vocal chords, or the *lips of the glottis,* accommodate themselves to the quantity of air, that it may pass through with equable velocity, and preserve the fidelity of the note.

"The differences which exist between different sorts of voices do not all depend on extent. There are strong voices, whose sounds are strong and noisy; soft voices, whose sounds are soft and sweet; fine voices, whose sounds are full and harmonious; there are voices that are just, others that are false; there are some flexible and light; others hard and heavy. Some have their fine sounds irregularly distributed; some in the bass, others in the treble, some in the *medium.* Singing may be articulate; then, instead of simply expressing *feelings,* it may be employed to express all the acts of the mind, but particularly those connected with the social passions.

"In the real expression of passion in the human voice, the sound is nearly uniform, or at least admits of very small variation. In so far, therefore, as mere sound is concerned, the tone of any passion would in a short time become unpleasing, from its uniformity; and if this effect were not forgot, in our attention to the language and sentiments of the person who addresses us, would be perceived by every ear.

" In music, on the contrary, the variety of related sounds which may be introduced, not only prevents this unpleasing effect of uniformity, and preserves the emotion which the prevailing tone is of itself able to excite, but by varying the expression of it, keeps both our attention and our imagination continually awake. The one resembles what we should feel from the passion of any person, who uniformily made use of the same words to express to us what he felt: the other, what we feel from that eloquence of passion, where new images are continually presenting themselves to the mind of the speaker, and a new source of delight is afforded to our imagination, in the perception of the agreement of those images with the emotions from which they arise. The effect of musical composition, in this light, resembles, in some measure, the progress of an oration, in which our interest is continually kept alive: and if it were possible for us, for a moment to forget that the performer is only repeating a lesson; were it possible for us to imagine, that the sounds we hear were the immediate expressions of his own emotion, the effect of music might be conceived in some measure to approach to the effect of eloquence. To those who have felt this influence, in the degree in which in some seasons of sensibility it may be felt, there is no improbability in the accounts of the effects of music in early times, when the profession of poetry and music was not separated; when the Bard, under the influence of some strong and present impression, accommodated his melody to the language of his own passion; and when the hearers, under the influence of the same impression, were prepared to go along with him, in every variety of that emotion which he felt and expressed himself."*

Declamation is a particular species of singing; only the intervals of the tones are not harmonic; and the tones themselves are not completely appreciable. Declamation appears to have differed much less from singing among the ancients, than among the moderns: perhaps it had some analogy with what is called recitative in our operas. The southern languages, being very much accentuated, that is, varying greatly in their tone in simple pronunciation, are very proper for being sung.

" All the modifications of voice which we have studied, are produced when the air passes from the chest. Voice may also be produced in the instant the air traverses the larynx to pass into the trachea; but this voice by *inspi-*

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* Alison's Essay on Taste, vol. i. page 263.

ration is hoarse, unequal, and of small extent: any variations in its tones are produced with difficulty: indeed, even by the characters of the phenomenon, we may suppose that it does not pass according to the ordinary laws of the economy. We can also speak and sing during inspiration. The modifications which the lips of the glottis suffer, during the production of voice by inspiration, are not known."*

In order to have some idea of the subtileness and perfection of the larynx, and particularly of the glottis, let us suppose, for the sake of illustration, the greatest distance of the two sides of it to be *one tenth part* of an inch, in the sounding of twelve notes (and to this the voice is easily extended); this line must be divided into twelve parts, each giving the aperture requisite for such a note, with a certain strength. If we consider, farther, the subdivision of notes of which the voice is susceptible, the motions of the glottis and epiglottis will appear exquisitely nice—indeed wonderful; for if, of two chords sounded exactly in unison, one be shortened but one *seven thousandth* part of its length, a just ear will perceive the discord, and a good voice will sound the difference, which is *one hundred and ninety-sixth* part of a note. But as this may appear too nice a calculation, let us only suppose that the voice can divide a note into a hundred parts; it follows, that the different apertures of the glottis actually divide the tenth part of an inch into *one thousand and two hundred parts,* the effect of each of which produces a sensible alteration on a good ear. Moreover, as both sides of the glottis move just *equally,* therefore, the divisions are just *double,*—or the sides of the glottis, by their motions, actually divide one tenth part of an inch into two thousand four hundred parts.

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* Majendie.

"To articulate or pronounce is not to speak. A bird pronounces words, and even phrases, but it does not *speak.* Man alone is endowed with *speech,* which is the most powerful means of expression possessed by the understanding. He alone attaches a meaning to the words that he pronounces, and to the arrangement that he gives them: and had he no intelligence, he would have no speech. The greater part of idiots cannot speak, they articulate sounds vaguely, which neither have nor can have any signification."*

There is another phenomenon of speech which has greatly puzzled physiologists and philosophers, viz. VEN-

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* Majendie.

TRILOQUISM. In times of ignorance and superstition this occasioned many subtile speculations; and, in the hands of impostors, was a powerful and fruitful agent in the operation of *miracles.* From the astonishment which it excites, the fame it acquires, and the gain it procures to those who are adepts in it, they are unwilling,—those of them who are able—to reveal the real secret of producing those sounds, and ascribe the power to some mysterious faculty, partially bestowed on mankind. But the truth is, that every person possesses the faculty, to a certain extent. To excel in it, requires the organs of voice to be particularly adapted to a species of sound which characterizes it,—in the same way that a person requires a voice naturally adapted to counter, tenor, or bass: but to excel in the one or in the other requires moreover much practice and perseverance.—The speculations of physiologists on this subject are truly diverting, to those who know the secret of it. One of the most eminent of them discusses the subject as follows:

"There was at the Café de la Grotte, in the Palais Royal, a man who could carry on a dialogue so naturally, that you would think you were listening to the conversation of two people at some distance from each other, and quite different in voice and tone. I have observed, that he was not inspiring when he spake from his belly, but that *less air* came from his mouth and nostrils than in his ordinary speaking." (Herein consists the whole secret of the affair, viz. in husbanding the air, causing the voice to reverberate about the pharynx, and articulating as near the mouth of the larynx as possible.) "Every time that he did so, he found a swelling in the region of the stomach;" (because a much greater exertion of the lungs is required, than when the breath has free course, as in ordinary speaking;) "sometimes he *felt wind moving lower down*, and could not go on long together without fatigue.—At first I conjectured that in this man a great part of the air driven out by expiration, did not issue from the mouth and the nasal passages; but that, being swallowed, and carried down into the stomach, it struck against some part of the intestines, and produced a real echo: but having since observed, with the greatest care, this curious phenomenon in M. Fitz-James, who exhibits it in the highest perfection, I have satisfied myself that the name of *ventriloquism* no way suits it, since the whole mechanism consists in a slow, gradual, attenuated expiration, whether for that purpose the artist employ the power of the will upon the muscles of the sides of the chest, or whether he hold the epiglottis slightly lowered [both are put in requisition] by means of the root of the tongue, of which he scarcely brings the point beyond the dental arches. This long expiration I always found to be preceded by a strong inspiration; and by this means he introduced into his lungs a large quantity of air of which he afterwards husbanded the use. The repletion of the stomach accordingly, was a great hinderance to the performance of M. Fitz-James, by preventing the descent of the midriff or diaphragm, which the chest would require, to dilate itself for the full quantity of air the lungs should receive. By accelerating or retarding the expiration, he could imitate different voices; made it seem that the speakers in a dialogue, which he carried on by himself, stood at different distances, and produced a complete illusion. No one could surpass M. Fitz-James in the art of deceiving, in this respect, the most wary and suspicious observer. He could set his organ to five or six different tones, pass rapidly from one to the other, as he did when he represented a very eager discussion in a popular society of the people; imitate the sound of a bell; and carry on singly a conversation in which one might think that several persons of different ages and sexes were taking parts. But what completed the illusion, and especially distinguished the art of the ventriloquist from that of the mimic, who can only counterfeit, consisted in the power of so modulating his voice, that one was deceived as to the *distance of the speaker*, in such sort that one voice came from the street, another from a neighbouring apartment, and a third from one who appeared to have clambered up to the roof of the house. It is easy to discern the value of such a talent in the days of the oracles."*

Lespagnol ascribes it to a peculiar action of the *membranous curtain* between the mouth and the nasal cavities. He very justly observes, that in common speaking two kinds of sound are produced,—one through the nose, the other through the mouth: and that both these at once strike the ear of a person close to the speaker, but to a person at a distance from the speaker, *that* through the mouth only is heard, and consequently the sound is much weaker. He is, therefore, of opinion that the secret of ventriloquism consists in preventing *any* sound from issuing through the nose, which, to a great extent may be done by raising the palatal curtain, above alluded to, so as to close up entirely the passage between the mouth and nose; and by this interruption, attenuating the sound. He would have come nearer the point by making the sound issue wholly through the *nose* instead of the *mouth*. The majority of writers on the subject ascribe it wholly to that amazing versatility of power in the vocal organs, enabling human beings to imitate every species and quality of sound that the ear can distinguish. That this imitative faculty greatly contributes to the deceptive feats practised by renowned ventriloquists, is unquestionable.

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* Richerand.

The following remarks of Sheridan, on the extensive power of imitation in the human voice, are not less eloquent than correct.

" As the passions and emotions of the several kinds of animals are very different, according to their different natures, so is there an equal diversity of tones by which these several passions and emotions are expressed :—from the horrible roarings of the lion, to the gentle bleatings of the lamb; from the loud bellowings of the wild bull, to the low purrings of the domestic cat. But, as there is no passion or emotion whatsoever, in the whole animal world, which is not to be found in man, so, equally comprehensive is the *language* of his passions, which are all manifested by suitable tones. The roaring of the lion is not more terrible than the voice of his anger : nor the cooings of the pigeon more soft than the murmurs of his love. The crowing of the morning cock is not so clear and sprightly as the notes of his joy; nor the melancholy mournings of the turtle, so plaintive as those of his woe. The organs of hearing, therefore, in man, are so constructed as not to be indifferent to any kind of tone, either in his own species or in the animal world, that is expressive of emotion or passion: from all, they receive either pleasure or pain, as they are affected with sympathy or antipathy. But extensive as are the powers of the human *ear*, those of the human *voice* do not fall short of them, but are exactly suited to them in degree and comprehension. *There is no tone which the ear can distinguish, that the voice, by pains and practice, is not capable of uttering.* Hence it comes to pass, that as man understands the language of the different tribes of animals, so he can make himself understood by them. The horse rejoices in the applauding tones of his rider's voice, and trembles when he changes them to those of anger. What blandishments do we see in the dog, when his master soothes him in kind notes! what fear, and even what shame, when he changes them to those of chiding! By those the waggoner directs his team, and the herdsman his flock. Even animals of the most savage nature, are not proof against the collective powers of the human voice; and the shouts of a multitude will put wild beasts to flight, who can hear without emotion the roarings of the thunder. Thus far we find that man, in his animal capacity, is furnished like all other animals, by nature herself, with a language, which requires neither study, art, nor imitation; which spontaneously breaks out in the exactest expressions, nicely proportioned to the degrees of his inward emotions; and which is not only universally understood, but felt by those of the same species, as also, in some degree, by the rest of the animal world."

In order to explain ventriloquism clearly, let us advert to the difficulty of ascertaining the *direction* of sounds that are strange to our ears, in a dark place. Any two or three persons may put this to the test of experience. If the sound be feeble and strange, the listener will find it almost impossible to tell whence it proceeds. The necessity of sight and reason in judging the direction, or even the distance of sound, will then be made palpable. Now, something similar to this is the situation of the *ventriloquist.* The sound is strange to your ear; his lips are motionless;* and, if he is expert at his business, he places the angle of the sound in the direction most likely to deceive: all these the listener must have observed. Now the question is:—"How does he contrive to utter words without moving his lips, or even opening his mouth?" Observe the following directions, and I will give you the first lesson; and from it,—so far as *ventriloquism* is concerned,—you may deduce all the rest of this marvellous phenomenon.

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* Men are so much accustomed to attend to the motions of the lips in speaking, that the speaker's words may be pretty correctly interpretated from their dumb motions.

Shut your mouth close:—lay hold of your nose between your finger and thumb, so as to prevent the air from issuing from your lungs. In this position endeavour to utter a sound similar to the expression of acute pain.* This sound will be perfectly audible to your own ears—not so to those around you, perhaps: but persist; it will, by degrees, become stronger and louder, agreeably to the infallible rule, "that muscles which are practised, become more fitted to the uses to which they are applied."

When you have practised this till you are perfectly audible to those around you, then endeavour to articulate: words without labials are easily pronounced. While you speak in this position,—that is, without allowing any of the sound to issue through your nose or mouth in the ordinary way,—it will be almost impossible to the listener, even though staring you in the face, to tell from what direction the sound proceeds. It will have the appearance of issuing more through your *belly* than any other place, and hence the term VENTRILOQUISM—or belly speaking. If you wish to become expert, and to astonish those who know nothing about the matter, you must practise;

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* It is remarkable, that this peculiar tone is nearly the same in almost all animals.

but observe, if you do not possess the faculty of IMITATION in a considerable degree, you will never excel.

After practising for some time, with the nose and mouth shut, then you may allow the sound to issue through the nose; but you must *practise* till you can make the teeth, and other parts of the palate, supply the place of the lips in uttering the labial consonants. Thus you proceed till you acquire, even when your mouth is open, a method of speaking altogether different from what is termed your natural method. By gradually opening and shutting the mouth, you will make the sound appear to approach or retreat; by twisting it from side to side, &c., you will make the voice appear to come from opposite directions. But be assured that if you are not an expert *mimic,* you will never make an expert *ventriloquist*: but you may be a good *mimic* without being a ventriloquist.

BURRING.

BURRING is supposed to be natural to some persons; but this is a mistake. Indeed the mere fact of the organs of speech being the same in those who *burr* that they are in those who do not, is, of itself, sufficient to controvert this notion. Speech is altogether an imitative art; consequently, children whose parents *burr, very naturally* imitate their parents in this, as in many other vices of speech and action. Children are apt to imitate their elder brothers or sisters also, in all their vices of speech. How those acquire it who have never been in contact with *burrers,* is not so easily explained. But it is sufficient for our present purpose that it *is acquired* ; and not very difficult to cure. To say that all who have it, or any other defect of speech, will ever be completely divested of it, were to assert what I do not believe.

But the failure will be owing, not so much to the obstinacy of the disease, as to irresolution in the patient. It is a vice which will never leave any person by passively contemplating it : a good deal of labor is necessary ; and unless the patient has resolution and perseverance enough to practise the prescribed exercises, he is not likely ever to be cured.

The *burr,* as every one knows, is an attempt to pronounce the letter R by bringing the *root* instead of the point of the tongue, in contact with the palate. If you are troubled with it, observe the following instructions, and perhaps you may be the better of them. You must recollect that there are *two* R's, a *final* and *initial* one : viz.—initial, when commencing a word or syllable; as, *R*ome, fe*r*ocious: final, when ending a word or syllable; as, silve*r*, pu*r*pose. The final *r* is never practised in Scotland by the vulgar. But whatever country you belong to, you should commence with the final, because it is more easily acquired, and leads very naturally and gradually into the initial one. Commence, then:—curve your tongue upwards, into a semicircle; with the *broad* point of it, touch the palate very gently, as far back from the teeth as you can;—when in this position, utter a sound; and while doing so, endeavour to make the tongue vibrate against the palate: you may fail in your first attempts, and produce a mere *inarticulate* sound; but persevere; by and by you will make the tongue *vibrate* against the *palate*, and then you will have achieved the most difficult part of your object.* When you can do this with perfect ease, carry your tongue gradually down against the roof of the mouth, causing it to vibrate gently in the same way against the whole palate, till you bring it almost close to the upper teeth: this last position is that of pronouncing the *initial r*. But it is the most difficult to attain; and probably, instead of it, you may first produce a *hissing* sound; but never mind; "the joys of conquest are the joys of man." Be only determined, and you will succeed. Of course, you will appear, to those who are accustomed to your present croaking manner of pronouncing the letter, somewhat *affected* at first: but habit will effectually correct your vice, and reconcile their prejudice.

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* This is the final *r*.

SLURRING.

ANOTHER disagreeable vice of speech is that of SLURRING the letter *t*, in such words as *but, not, at, hot,* and indeed wherever the letter occurs, and ending the words by an abrupt impulse in the larynx.* The only method of correcting this, like all other vices, is to teach, or show the pupil, how the letter ought to be pronounced.

Place the tip of your tongue firmly against the palate, a little above the teeth. In this position produce voice by a rapid impulse of breath, and at the same instant disengage your tongue from the palate.

Some persons pronounce this letter, as well as its flat relative the *d*, in a thick, disagreeable manner, by placing the tip of the tongue between the teeth, instead of putting it in the proper position.

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* This particular sound cannot be well explained: it must be exemplified.

Sometimes we hear the letter *l* pronounced in a thick, disagreeable manner, which fault arises from the same cause that occasions the disagreeableness of the letter *t* and its flat relative *d*. It must be amended by adopting the same method of correction, viz. placing the tongue right against the palate, and practising the letter frequently.

SPEAKING THROUGH THE NOSE.

A THIRD disagreeable vice of speaking is what is generally but erroneously called SPEAKING THROUGH THE NOSE. The person troubled with this is said to have a *nasal twang*. But the fault arises from *not speaking through the nose*, as every one may ascertain by holding his nostrils, while speaking: consequently, it must be corrected by adopting an opposite course, viz. speaking through the nose.

You must, therefore, choose words containing *m* and *n*; practise these; always taking care to keep your mouth shut, that the sound may issue wholly through the nose. Or you may practise the letters singly; continuing the sound while your respiration lasts. This will clear the nasal passage, which is a little obstructed by want of use, and accustom you to pronounce the nasal letters with ease and clearness. Sometimes this fault arises from polypus in the nose, and then the effect can be removed only by removing the cause, which is the business of the surgeon.

LISPING.

WHAT is called LISPING is among the most common vices of speaking. This fault consists in giving the letter *s* the sharp sound of *th*, and may arise from want of the fore-teeth, or from bad habit. When from the former, you must change the position of the tongue, (which ought to be against the upper fore-teeth,) by raising and placing it against the *gum*. The *s* thus pronounced will at first partake of the nature of a *whistle*; but practice will wear off this sound. The latter fault arises from placing the point of the tongue between the upper and lower teeth, as in pronouncing *th* in *thought*, instead of placing it against the inner surface of the upper teeth.

To correct this, close the sharp edges of the upper and under teeth against each other, so that the tongue can get no admittance between them: place it, as already stated, against the inner surface of the upper teeth, and endeavour to utter a hissing sound. Take no refusal, but proceed thus till you have obtained your object.

Persons who lisp often pronounce *th,* particularly when final, with a hissing sound like *s.* Such words as *teeth, doth, mouth,* &c., they utter as if written *teess, doss, mouss.* In this case all that is required is—to *exchange* their practice; which they will easily do by being shown the proper organic position of the respective letters.

SPASMODIC STAMMERING.

SPASMODIC STAMMERING, or STUTTERING, is one of the most repugnant idiocratic maladies to which mankind is subject, and almost as incomprehensible as the Cholera Morbus. It has hitherto baffled all physiologists to give any thing like a satisfactory explanation of its cause; and while the *cause* of the disease is so imperfectly understood, it is not likely that a generally successful, much less an infallible, cure for it can be discovered. Many have been the speculations of physiologists and philosophers on this afflicting malady; and equally numerous have been the remedies employed, and the expedients resorted to, for its removal.

Darwin includes it among the diseases of association: the following explanation of it by Hippocrates, seems to imply that he was of the same opinion. "Indistinctness of utterance (impediment of speech) arises from the hearing of external sounds. In the one case, before the sentence which should precede is completed, *words* foreign to it are introduced; in the other, before *that which is conceived* is fully expressed, intervening *thoughts* are charged upon it."

Thus it is plain, whether we refer it to irregularity in the arrangement and utterance of "words" composing a "sentence," or to incoherence in the "conception" of ideas, that his explanation resolves itself into *association*, and is very nearly similar to Darwin's theory; nor is it at all unlikely that the latter took the hint from Hippocrates. Others have classed it among the nervous complaints. The present fashionable theory, however, ascribes it to mismanagement of the epiglottis, or to *collapse* of the lungs. The partisans of each of these theories have adapted their mode of cure to their respective and favourite theory; and all of them have been proved, by experience, to be about equally successful. Wonders, even miracles almost, have been wrought by some person or other proceeding upon each of these theories. The most obstinate cases have been removed in a few weeks; nay, some in a few days; in fact, some have disappeared even in *a few hours.* The difference between those who profess such barefaced quackery, and those who believe them, is, that the former are knaves, and the latter *fools;* and deserve to be *fleeced,* if I may be allowed the expression, of the exorbitant sums which they pay for their credulity. Whether the following explanation will entirely elucidate this hitherto mysterious malady or not, it were too presumptuous in the author to anticipate; but he feels perfectly confident that it will throw much light upon the subject; and he hopes it will be the means of directing the attention of those who have better opportunities than himself, of putting it to the test, not of experience, but *experiment,* to a subject well worthy of their most serious regard. And as he (the author) has never heard or read any thing even approaching to his own theory, he unscrupulously claims the merit, if there is any merit in it, of originality.

To understand the theory *fully,* presupposes a knowledge of the anatomy and physiology of the human frame, and particularly an acquaintance with the nerves and muscles of the throat, thorax, and abdomen; nor is it less necessary to have some knowledge of the different veins, arteries, and nerves of the neck. In order to simplify the subject, and bring it as much as possible within the comprehension of every one, we must advert to two phenomena; not, as is generally thought, peculiar to the human species, but quite familiar to every individual of that species, and very similar in their manifestation to the complaint under consideration, viz. Weeping and Laughter.

It has been already observed, (in page 7,) that the *vagitus,* or that voice by which new-born infants express their wants, is very different from the voice of boys or adults. The same may be observed of their *laughter* and *weeping.* In the latter, very young infants rarely shed *tears.* This, of itself, is a remarkable difference between the weeping of infants and that of adults.

"It appears," observes Dr Hartley, "that as soon as children have learned to cry, or yield a sound from nascent pain, and from *pleasures* just passing into pain, titillation may excite short alternate nascent cries in them, *i. e.* laughter; but not before. If the impressions be made upon the chest, the effect will be quicker and stronger, because these impressions have a direct influence upon the muscles concerned in laughter." In another place, he says, "Laughter is a *nascent* cry, recurring again and again. By degrees it puts on a certain *type,* and recurs again and again, according to that type, just as other actions. And it is excited in children not only by the sense of *tickling*, which lies, as it were, between pleasure and pain, but by the apprehension of this, or any other apprehension sufficiently moderate; by every surprise, and every mental emotion that lies between pleasure and pain, and by all the associates of these, as particularly by seeing others laugh." [This is exactly the manner in which stammering is contracted.] "And thus children laugh more and more, and get a power of performing the action of laughter at pleasure, though with less force than when it is *excited by its proper cause in full vigour.*" Thus, then, we see that, according to this doctrine, the same automatic motions and gestures observable in the momentary fears and momentary joys which constitute the laughter of young children, become afterwards associated with less and less similar causes perpetually. Then almost any brisk emotion or surprise suddenly checked, and recurring alternately, will produce it; and, at last, any strong opposition or contrast in things, whether they be personally interested in them or not. When we are advanced in life, a variety of passions, and a regard to decorum, check the propensity to laughter; whereas many idiots continue to laugh on the slightest occasions imaginable; for

> "The loud laugh *bespeaks* the *vacant* mind."

Nor is there any thing in this progress at variance with many other processes in human nature, whereby a variety of the same motions and gestures become associated with causes that are slighter and slighter continually, till, at last, any thing bearing the faintest resemblance to the original cause will be sufficient to excite them. One of these processes is SPASMODIC STAMMERING, as will be made to appear in the sequel. Let us examine further into the motions and gestures of *weeping.* Let any one, for a moment, reflect what a number of members are engaged in this phenomenon of our nature! It puts the hand to the eyes; sheds tears; rests the head upon the bosom; convulses the cheeks; contorts the countenance; and draws the brows down upon the eyelids. It inflames the eyes and the cheeks; it causes the head to ache; the nose to run; the mouth to slaver; and the lips to quiver. It shakes the whole chest with sighs and sobs; and *interrupts the voice,* which produces impediment of speech. It belongs to pathology to explain the direct causes of all these manifestations. It is sufficient here to give such an explanation of them, as will more clearly elucidate the malady to which we mean to make an allusion to them subservient. One circumstance, however, we must not omit to notice, viz. that *joy* sometimes occasions *weeping,* and *sorrow* produces *laughter;* as in the operations of nature we see contrary effects produced by the same causes, and the same effect result from contrary causes, through a different mode of operation. The sun softens wax, and hardens clay; it tans the skin, and bleaches cloth; cold, as well as heat, withers the herb, and warms the earth till it smoke; nor is the one less necessary in its due season than the other, to fertilize the earth; so also contrary passions produce contrary effects, as to weep and laugh both for joy and sorrow. Examples of this daily occur. If a person feel any thing very hot, imagining it to be cold, he will laugh at the hurt he receives; or if you touch another's wound, he will express his discontent by laughter. And who will say that he feels any pleasure in tickling, though he laugh extravagantly while suffering it? Democritus laughed at the follies and vanities which made Heraclitus weep. Sometimes, in a paroxysm of distress, the anguish is expressed by a sort of sardonic laugh, as if the heart felt pleasure from what wrings it into agony.

It is observed by Beattie, "that there are men who, by forcing a smile, endeavour sometimes to hide from others, and from *themselves* too, perhaps, their malevolence or envy; such laughter is *unnatural.* The sound of it offends the ear; the features distorted by it seem horrible to the eye. A mixture of hypocrisy, malice, and cruel joy, thus displayed on the countenance, is one of the most hateful sights in nature, and transforms the human face divine into the visage of a fiend. Similar to this is the smile of a wicked person, pleasing himself with the hope of accomplishing his evil purposes." He then quotes Milton's well-known striking picture of this last species of laughter :

> "Death
> Grinned horribly a ghastly smile, to hear
> His famine should be filled, and blessed his maw
> Destined to that good hour."

And concludes by saying, "Enough of this. Laughter that makes a man a fiend or a monster, I have no inclination to analyse. My inquiries are confined to that species of it, which is at once natural and innocent."

I have no objections to any of these observations, except the assertion, that the laugh of hypocrisy, and that of a "wicked person pleasing himself with the hope of accomplishing his evil purpose," are unnatural. In a *moral* sense, they are so; but in a *physical* sense they are not, as we shall see hereafter.

Before we explain why grief excites laughter, an effect as strange as weeping for joy, let us advert to the parts affected during laughter.

The parts first affected during laughter, are the heart and diaphragm. In the human species the diaphragm is much more closely fastened to the heart, by its caul and skin, than in the lower animals. The *object* of laughter, then, being a mixture of "pleasure and pain," excites the nerves, causes the heart to vibrate, or balance between these two affections; or, in other words, it excites it to rapid and contrary motions of opening and shutting; and these actions being so repugnant to each other, produce an extraordinary agitation in the part. By this agitation and close coupling of the heart and diaphragm, the latter draws, by consent, other parts into similar motion; and hence a laugh is expressed by interrupted expirations, because the diaphragm is not suffered to finish its contraction quietly, but is restrained and retarded by the heart.

Thus knowing the cause of laughter and the parts affected by it, we shall be more able to comprehend why a person will sometimes laugh for grief as well as weep for joy.

Of all the muscles of the body, the diaphragm is per-

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haps the most noble, and the most useful.* As it is the chief instrument in respiration, its motion never ceases, even in sleep, when all the other muscles take their rest. With the motion of this muscle, accords that of several others, especially those of the under jaw, and of the cheeks and lips, from the connexion of their nerves. When the diaphragm is excited to any extraordinary motion—as in grief, fear, joy, &c., it leads the cheeks and lips into a similar motion. How, then, is the diaphragm affected in grief? Just in the same manner that it is in mirth, *i. e.* hindered in its contraction, by the contraction of the heart. In grief we feel the heart collapsing,—it calls in its spirits, closes itself, and fills the neighbouring parts with an extra quantity of blood. By these parts, again, being so overloaded, the diaphragm is straitened and impeded in its contraction by the caul of the heart. By these means the expiration is produced by fits, and not continuously, as in ordinary breathing. The cause of this interrupted expiration may be better understood by considering the diaphragm, like the leather of a pair of bellows, joined about the sides of the chest, which answer to the boards of the bellows. Again, the muscles of the lips and cheeks, agreeing in their nerves with the diaphragm, are, in sudden pain or fear, easily excited to similar contractions to those of laughter. This is one kind of laughter caused by grief. The other, noticed by Beattie, is composed of joy rising from confidence of revenge, mingled with a twinge of grief;—as a man that has received an insult from an enemy, when certain of his revenge, will laugh, even though highly indignant and grieved at the insult. From this confidence of revenge proceeds that mixture of joy and grief, which forces out that sardonic, bitter, short, grinning laugh, immediately overtaken with more grief, which flushes the cheeks with heat and blood,—through the dilatation of the heart, and surcharge of the capillaries—contracts their muscles, exposes the teeth, and causes that contortion apparent in laughter.

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* "Nobilissimus post cor musculus." Haller.

"Any irritation of the phrenic nerve convulses the diaphragm; and if the former be cut across, the latter is completely paralysed. (A sardonic smile is produced on the face; and convulsive heavings in the shoulders, by a wound in the diaphragm.) A derangement in the *portio dura,* or respiratory nerve of the face, will produce frequent convulsive distortions of the face."

"Physiologists who have not investigated the cause, are yet agreed in describing laughter to be a condition of the respiratory muscles, where the air is drawn in rapidly, and thrown out in short spasmodic motions of these muscles; that crying is nearly the reverse, the inspiration being cut by spasmodic actions of the muscles of inspiration. By these considerations are explained the *subrisus,* which arises from abdominal irritation, and the sardonic retraction of the muscles of the face produced by wounds of vital parts, and particularly of the diaphragm. It explains also the successive convulsive lifting of the shoulders in wounds of the diaphragm.

"That a system of nerves, so intimately combined as this is with the other parts of the general system, should suffer in hysterical disorders, cannot surprise us; and, admitting that irritation reaches to the respiratory system, we may perceive how rapidly the change may be produced, from the convulsions of laughter to those of crying; and where, if there be a corresponding condition of the mind, it rather follows than precedes the expression of the frame.

"It would have been extraordinary if we had arrived at any satisfactory theory of expression, before it was known through what instruments the mind influenced the body during emotion or passion. But since we know that the division of the respiratory nerve of the face deprives an animal of all expression, and that the expressive smile of the human face is lost by an injury of this nerve; since it is equally apparent that the convulsions of laughter arise from an influence extended over this class of nerves, it comes to be in some sort a duty, in pursuing this matter, to examine farther into the subject of expression. We may be, at the same time, assured of this, that whatever serves to explain the constant and natural operations of the frame, will also exhibit to us the symptoms of disease with more precision.

"In terror, we can readily conceive why a man stands with his eyes intently fixed on the object of his fears; the eye-brows are elevated, and the eye-balls largely uncovered; or why, with hesitating and bewildered steps, his eyes are rapidly and wildly in search of something. In this we only perceive the intent application of his mind to the objects of his apprehensions, and its direct influence on the outward organs. But when we observe him farther, there is a spasm on his breast; he cannot breathe freely; the chest remains elevated, and his respiration is short and rapid; there is a gasping and convulsive motion of his lips; a tremor on his hollow cheeks; a gulping and catching of his throat; his heart knocks at his ribs, while yet there is no force in the circulation; the lips and cheeks being ashy pale. It is obvious that there is here a reflected influence in operation.

"The language and sentiments of every people have pointed to the heart as the seat of passion, and every individual must have felt its truth; for though the heart be not in the proper sense the seat of passion, it is influenced by the conditions of the mind, and from thence its influence is extended through the respiratory organs, so as to mount to the throat, and lips, and cheeks, and account for every movement in passion which is not explained by the direct influence of the mind upon the features.

"So we shall find, if we attend to the expression of grief, that the same phenomena are presented; and we may catalogue them, as it were, anatomically.

"Imagine the overwhelming influence of grief; the object in the mind has absorbed the powers of the frame; the body is no more regarded, the spirits have left it; it reclines and the limbs gravitate; the whole body is nerveless and relaxed, and the person scarcely breathes: so far there is no difficulty in comprehending the effect in the causes.

"But why, at intervals, is there a long drawn sigh, why are the neck and throat convulsed, and whence the quivering and swelling of the lip; why the deadly paleness, and the surface earthy cold; or why does convulsion spread over the frame like a paroxysm of suffocation?

"To those I address, it is unnecessary to go farther, than to indicate that the nerves treated of in these papers are the instruments of expression, from the smile upon the infant's cheek to the last agony of life. It is when the strong man is subdued by this mysterious influence of soul and body, and when the passions may be truly said to tear the breast, that we have the most affecting picture of human frailty, and the most unequivocal proof that it is the order of the functions which we have been considering that is then affected. In the first struggles of the infant to draw breath, in the man recovering from a state of suffocation, and in the agony of passion, when the breast labours from the influence of the heart, the same system of parts is affected, the same nerves, the same muscles, and the symptoms or characters have a strict resemblance?"*

It will be perceived from the above quotation, that Mr Bell considers laughing and weeping to proceed from opposite actions of the respiratory muscles: upon reconsidering the subject, I am persuaded he will find them both to result from very nearly similar actions of the very same muscles; although these muscles are actuated by different affections or emotions of the mind, and, consequently, assume the charactèristic expressions of these affections. In weeping, the face is chiefly contorted in *ex*piration, because the diaphragm being slackened, the heart has more power over it than in *in*spiration, when the diaphragm, from the dilatation of the chest, is extended.

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* Bell's Anat. vol. ii. p. 546.

The *speech,* also, is interrupted in weeping, because the *chest* in expiration does not sink equably and *gradually,* but being probably interrupted by the contraction of the heart, remits, as it were, its tension, and finishes its contraction by impulses, or strokes: as if you were to fill a pair of bellows, and not suffer them to shut of themselves, but divide them, by unequal pressures, into abrupt puffs and blasts. Thus, the voice, being produced during *expiration,* is compelled to accommodate itself to the breath, and is likewise uttered in weeping by abrupt sobs. Besides the chest, speech requires the assistance of the intercostal muscles, as well as those of the abdomen,* which through fear, or grief, being now exhausted, (through the exhaustion of that nervous excitement which was wont to be called "animal spirits," and which is not yet rightly understood, but is the author of motion in those muscles,)* cannot deliver the voice smooth and uniform, any more than a child could press down a large pair of smiths' bellows, but is forced to do that by poises, which strength could with ease accomplish at once.

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* These muscles of the ribs are the appropriate muscles of respiration, and are united in office with the diaphragm and abdominal muscles. But it must be observed, that there are many other muscles brought into action when the respiration is excited, as well as

You must have observed, that weeping is often accompanied by sobs and sighs. You may have observed, also, that sobbing is never without weeping; but sighs are frequently unaccompanied by either weeping or sobbing. To understand these two affections, please to recollect what has already been said of the diaphragm and the external muscles of the ribs, commonly called the *outer*

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when the organs of respiration are brought to be subservient to other offices, as in coughing, sneezing, speaking, smelling, &c.—See Bell's Anat. vol. i. p. 345. See also p. 361.

[*] One of the most beautiful and most important arrangements of the human system, is the provision made for the supply of blood to the nerves. They are furnished with innumerable veins, and the accession of blood must be constant and unceasing. If this necessary accession be interrupted by any means, or accident, sensibility is entirely suspended, and upon its restoration, a painful sensation, similar to that accompanying the return of circulation after submersion in cold water, is experienced.

intercostals. Remember, also, how the heart is affected in grief. The diaphragm dilates, to enlarge the chest for inhaling the air, or for the purpose of inspiration. Now, when we are so overcome with grief as to shed tears, the diaphragm and its consenting muscles suffer a weakness by the retraction of the nervous energy, and thus they are obliged to make more pulls than one for dilating the chest, (as was already explained in the motion of contraction;) so that the inspiration is not inhaled at one straining of their fibres, but by repeated attempts. Moreover, the heat of those parts being retracted, makes them, perhaps, less pliant to the force of the muscles, and renders the respiration, which requires more dilatation than formerly, more difficult to be performed, because the heat about the heart itself is now greater than before the passion, and produces a sort of suffocation.

That chillness of the heart, which is sensibly felt at any sudden disastrous story, or unlooked-for accident, or any fresh calamity, is, perhaps, occasioned by accession of blood; and which, although still hot, yet deficient in that fervent heat so natural to the heart, seems to be cool in comparison to what it felt before; as if you were to throw water into that which is boiling; although the added water be hot, yet being inferior in degree to the fervent heat of the other, stops the boiling.

Thus, though the heart seems to receive a chilling from this sudden impulse, yet from that buoyant reaction which is natural to all vital parts, that exertion to recover their wonted tone and elasticity, it immediately rallies, if I may be allowed the expression, its forces; but not being answered by the breathing parts, on account of their temporary imbecility, the inspiration is performed by sobs or fits, which should have been performed by a single draught. The only use of sighing seems to be to cool and refresh the heart and lungs with pure air, which is the nourishment of the vital spirits.

Yawning seems akin to sighing. For in yawning we perceive that the chest and diaphragm are dilated in the same manner as in sighing; we feel also the same kind of refreshing about the heart. Yawning is, besides, sometimes attended by *stretching*.

This may be caused not only by the weakness of the muscles of the thorax, and the exhaustion of vital energy about the heart and midriff, but also by the weight of the heart; which, by reason of the accession of humours about its veins and arteries, is increased, and, consequently, lies more heavily upon the diaphragm than before. Perhaps it endeavours to ease itself of this burden by stretching, which *lifts up the heart* for the instant, and recomforts the diaphragm.

Thus, then, it appears that the necessity of fresh air, the cooling of the heart, and the easing of the burden upon the diaphragm, and its dilatation,—the motions of which the whole chest follows,—are the causes of sobbing and sighing. It is to be observed, also, that sobbing and sighing, differing from each other merely in this, that sobs are sighs interrupted, and sighs sobs at large, if they be not very vehement, or of long duration, give comfort; but if they be very vehement, then they shake the heart and midriff too much, and occasion pain by means of their violence.

Thus, then, we see that the irregular and conflicting motions of certain muscles are the *proximate* cause of laughter, weeping, sobbing, and sighing. And as the effect produced by these on the face and chest so nearly resemble those produced by spasmodic stammering, we may fairly infer that this is produced by the same agents. The primary causes of all of them reside in the *emotions* of the mind, and seem equally inscrutable to physiology or metaphysics. There are, however, intermediate agents, which must not be overlooked; because they seem the handmaids or ministers of the mind, if the terms may be allowed, in expressing its affections, and conveying its behests throughout every portion of the frame. These are the Nerves. Upon their perfection depend the activity and energy of the muscles; and should they be deranged, the action of the muscles will neither be energetic nor regular. From all the experience I have had, I am induced to ascribe spasmodic stammering chiefly to a want of synenergy among the nerves and muscles, but particularly among the *respiratory nerves,* and those of the diaphragm.* There is little doubt that this affec-

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* "The support of the great blood-vessels, the compression of the viscera, the expulsion of the urine and fæces, the ridding the womb of its burden, all could have been performed by the pressure of the abdominal muscles alone; the diaphragm is added merely for breathing."—Bell's Anatomy, vol. ii. p. 13.

"The chief use of the diaphragm is in breathing; and in this office it is so perfect, that though there be a complete anchylosis of the ribs (as has often happened), the person lives and breathes, and never feels the loss. The diaphragm is in its natural state convex towards the thorax; when it acts it becomes plain, the thorax is enlarged, and by the mere weight of the air the lungs are unfolded, and follow the diaphragm. No vacuum is ever found betwixt the diaphragm and the lungs; but the lungs follow the ribs and diaphragm as closely as if they adhered to them; and, indeed, when they do adhere, it is not known by any distress. So we draw in the breath; and when the abdominal muscles re-act, the diaphragm yields, goes back into the thorax, and grows convex again, by which we blow out the breath; and while the diaphragm is acting, the abdominal muscles are relaxed, yield, and are pushed out, and leave the ribs free, to be raised by their levator muscles. And, again, tion is natural to some persons, as are a number of other nervous affections and discordancies of system; but it is readily acquired by *imitation,* especially by young children; and as its obstinacy depends on *practice,* and the complaint often merely a bad *habit,* slight and even scarcely perceptible in its origin, but, like all other habits, strengthened and confirmed by constant practice; it becomes as inveterate in the latter as in the former case. I am disposed to suspect that some children acquire it while in the act of weaning, because then they are

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when the abdominal muscles re-act, the diaphragm in its turn yields so, that they at once force up the diaphragm, and pull down the borders of the thorax, assisting the serrated muscles which depress the ribs.

"There is also, in every great function, such a wonderful combination of actions conspiring to one end, as cannot be even enumerated here. But the alternate action and re-action of the abdominal muscles, draw in and expel the breath, promote the circulation, and gently agitate the bowels, while their more violent actions discharge the fæces and urine, and assist the womb; and vomiting, yawning, coughing, laughing, crying, hiccup, and the rest, are its stronger and irregular actions. The diaphragm might well be named by Haller, "Nobilissimus post cor musculus." And Buffon, who affected the character of anatomist with but little knowledge of the human body, might mistake its central tendon for a nervous centre, the place of all emotions, and almost the seat of the soul; for the ancients confounded the names and ideas of tendon and nerve. And in sickness and oppression, lowness and sighing, in weeping or laughing, in joy or in fear, all our feelings seem to concentrate in this part."—See Bell's Anatomy, vol. i. p. 374.

inclined, and often allowed, to suck their fingers; this they continue to do for years. Indeed, I have known some persons who continued all their lives to *suck*, that is, to employ the organs as in the act of sucking, even though they had nothing in the mouth. This begets in the diaphragm a habit of counter action to that of regular inspiration; it induces the respiratory muscles to pull in opposite directions; and thus, by frequent repetitions, lead to the complaint in question. From the connexion between the nerves of the face, larynx, &c., and those that supply the diaphragm, and the muscles employed in respiration, arise those facial contortions observable in weeping, laughing, sneezing, coughing, and spasmodic stammering.*

I am aware that the seat of this complaint has been placed wholly in the glottis and epiglottis, and a plausible theory thence deduced. But theory and practice are often at variance; and so are they in the present case. Indeed it does not seem possible for the epiglottis to keep shut, or for the glottis to draw its edges so closely together, without external pressure, as would be sufficient to repel the air against the powerful action of the diaphragm in propelling it through the trachea. Nothing but a disruption, or extraordinary irritation of the nerves, causing a convulsion of the larynx, could do this. And even this seems scarcely sufficient to extinguish the voice entirely, or to produce those abrupt gusts of respiration, and concomitant distortions of the features, which characterize spasmodic stammering.

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* Laughing, weeping, and stammering may be counterfeited; but when so, the heart has no share in them; when real, the heart is always affected.

But, in fact, there is no use in arguing about the matter. I have not the slightest doubt, in my own mind, that the whole lies in an irregular action of the diaphragm, occasioned by a discordancy among the motory nerves. No doubt the circulation is affected also by these convulsions; because the free action of the diaphragm is essential to circulation and respiration. When it ceases its alternate motions, life must cease. But those sudden stops and *gaspings,* and choking-like spasms in the stammerer, arise chiefly from the *diaphragm's not obeying the will in propelling a gradual current of air through the trachea, for the supply of the larynx or vocal organ.* Nor is this at all wonderful, when we consider that the sole use of the diaphram is for respiration.

But the question now is, how are we to perform a cure? Is it possible that a cure can be performed on every individual affected by this malady? Yes; it is possible, I think; but not very probable. The nature and character of the cure may be inferred from the explanation of the disease. A *bad habit* must be superinduced by a good one; and this is not to be accomplished, especially in the present instance, without a great deal of care and laborious exercise in the patient, as well as vigilant, patient attention, and well-adapted instruction, on the part of the teacher, or physician. And it is well known, that there are some persons of so sluggish a disposition, or so perverted an intellect, as to be totally, I might almost say shamefully regardless of their own interest, and the pain they inflict on others by their horrible grimaces and gasping convulsions. Little co-operation is to be expected from these. If a cure could be performed by breathing, or blowing upon them, it might be expected; but where so much depends upon the patient's own activity and industry, these are not the proper subjects; they may at once be devoted to their unhappy fate—the *pity* of the best disposed part of their fellow creatures, and the mimicry and ridicule of the other.

It is impossible to prescribe any particular method of procedure that will be universally applicable. The cure must, in all cases, be suited to the temper, habits, age, health, strength, or weakness of the patient.

Besides, although the general features of the malady, in different individuals, greatly resemble each other, yet I have never met with any two cases exactly similar; nor did I ever find the same mode of treatment equally successful with different subjects. Indeed, in this, as in every thing else depending on practice and discrimination, experience alone can qualify a person to distinguish the peculiarities of the complaint, and adapt the cure; consequently it would answer no purpose to give any precise rules; indeed they cannot be given. The chief thing to be attended to, is to make the patient *breathe freely* while in the act of speaking; and this can only be done by placing the muscles—particularly the diaphragm of the patient—in the proper position, and by destroying the *association* which custom has established in his mind between the act of stammering and the words or letters on which he is *habituated* to this practice. To accomplish this latter part of the cure is no very easy task. Any one who is in the habit of giving instructions in *reading*, must have observed the difficulty of eradicating provincial, and other vulgar or false pronunciations, even when the pupil is most anxious to get rid of them. So inveterately has *habit* ASSOCIATED the word in the mind with the *customary pronunciation*, that I have often known a person challenged—ay, a hundred times, for the same word! That this association is one of the most obstinate parts of the stammerer's complaint, may easily be proved by making him pronounce the first syllable of a word singly; for instance, *mo*, in the word *mother*, which probably he will do with perfect ease; but the moment he associates the idea of pronouncing the entire word, with the attempt, he immediately hesitates on the very syllable which, singly, he can pronounce with the utmost ease and freedom. This shows that association greatly induces the hesitation; for the syllable *mo* is not organically more difficult to pronounce when joined to *ther*, than when alone: but he has been *habituated* to associate a *stammer* with the entire word; and *second nature* will assert her prerogative. I have selected the word mother, not because it is peculiarly difficult to utter, but because it occurred first. Any other dissyllable or polysyllable commencing with a consonant, will answer the same purpose, provided the patient be *accustomed* to stammer on it. It is of the utmost importance to convince the patient of the *possibility* of his cure. This gives him confidence, and excites his perseverance. I have never found them improve rapidly till I made them read or speak before large assemblies, say three or four hundred. Few, however, can possess the opportunity of doing this; and nothing else can supply the want of it. But before the experiment can with safety be made, the patient should have acquired some degree of confidence, by previously addressing less numerous audiences.

This association, which is mere *habit,* must not, however, be confounded with the *primary* cause of stuttering. The primary cause of the habit, is a distraction among the different systems of nerves—particularly those belonging to the diaphragm; consequently these must be amended, and brought into simultaneous operation, before a cure can be effectually performed. While the patient is under treatment, tonics should be administered, but cautiously, particularly in the first stage. He should, moreover, be exercised in such feats as have a tendency to strengthen his nerves, muscles, and whole frame, as well as produce a free and uniform circulation.

It is not true that those troubled with this malady are naturally weaker, either in body or in mind, than the generality of persons around them. Indeed, I have seldom known any of them that was not in point of intellect rather superior, than inferior, to his companions, of the same age and opportunities. It is true, the unhappy sufferer appears, from his inability to show his talents and attainments, to be inferior to his companions. Besides, the education of such persons as one labouring under this repugnant infirmity, is not carried on with the same steady, rapid, uninterrupted progress. But, in general, I have found them shrewd of mind, active, and lithe of limb.

I do not think, that medical men will ever be very successful in curing this complaint—although, from their acquaintance with the parts affected, they must understand its origin and modifications incomparably better than those who are ignorant of the different systems of the human frame.

The cure depends more upon practice in speaking,—particularly before a multitude,—than upon medical aid. Hence the medical practitioner cannot apply the most efficacious remedy, because he has it not in his power. Besides, it requires unintermitted attention, and the continual presence of the person affected,—at least for some considerable time at the beginning.

Another reason for their not being very successful is, that, unless they demand exorbitant fees, their time could, in general, be more lucratively employed. If, however, they think they are better qualified, and more capable of eradicating this disease, than any other class of persons, let them try their skill:—So wishing them success, with all my heart; and their patients a happy issue out of their sufferings, I bid them both farewell in the meantime.

Mr H. may be consulted—if by letter, post paid—by calling at, or addressing to, 9, George's Place, Glasgow.

THE END.

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